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EXAMINER	
BRIGGS, NATHANAEL R	

ART UNIT	PAPER NUMBER
2871	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/517,562	POWER, GARY FAIRLESS	
	Examiner	Art Unit	
	Nathanael Briggs	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/7/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 22 and 32 are objected to because of the following informalities: They depend on the method of claim 20, but claim 20 is a device. Dependence on claim 21 is assumed, as claim 21 is an independent method claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 8, 10-11, 13-32, 34, 36-37, and 41-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Schadt et al. (US 6,734,936).

4. Regarding claim 1, Schadt discloses a liquid crystal device (see figures 1 and 6, for instance) comprising a substrate (1); at least one photo-alignment layer (3) applied to the substrate (1) and which is uniformly aligned with a polarized light source (column 6, lines 26-28); a nematic liquid crystal layer (4; column 15, line 49) applied to the photo-alignment layer (3); and a latent image (column 6, line 38) formed by the photo-alignment layer (3) and the liquid crystal layer (4) wherein the latent image comprises a pattern formed in the at least one photo-alignment layer (3) and/or in the liquid crystal

layer (4) without the use of a mask and the latent image is viewable under cross-polarizers (24, 25). Claim 1 is therefore unpatentable.

5. Regarding claim 2, Schadt discloses a liquid crystal device (see figures 1 and 6, for instance) comprising a substrate (1); at least one photo-alignment layer (3) applied to the substrate (1) and which is uniformly aligned with a polarized light source (column 6, lines 26-28); a nematic liquid crystal layer (4; column 15, line 49) applied to the photo-alignment layer (3); and a latent image (column 6, line 38) viewable under cross-polarizers (24, 25) formed in the at least one photo-alignment layer (3) and/or the liquid crystal layer (4), wherein the latent image is formed by image areas and/or non-image areas written in the at least one photo-alignment layer and/or the liquid crystal layer (column 8, lines 33-38). Claim 2 is therefore unpatentable.

6. Regarding claim 3, Schadt discloses a liquid crystal device according to claim 1 (see figures 1 and 6, for instance) wherein a pattern forming the latent image is laser written (column 6, lines 26-28; column 8, lines 61-65) into the photo-alignment layer (3) and/or in the liquid crystal layer (4). Claim 3 is therefore unpatentable.

7. Regarding claim 4, Schadt discloses a liquid crystal device according to claim 2 (see figures 1 and 6, for instance) wherein the latent image is formed by image areas and/or non-image areas of the photo-alignment layer (3) and/or the liquid crystal layer (4) removed by laser ablation (column 6, lines 26-28; column 8, lines 61-65). Claim 4 is therefore unpatentable.

8. Regarding claim 8, Schadt discloses a liquid crystal device according to claim 1 (see figures 1 and 6, for instance) wherein the liquid crystal layer (4) covers the substrate (1) in the entire area of the device (7). Claim 8 is therefore unpatentable.

9. Regarding claim 10, Schadt discloses a liquid crystal device according to claim 9 (see figures 1 and 6, for instance) wherein the photo-alignment layer (3) covers the substrate (1) in the entire area of the device (7). Claim 10 is therefore unpatentable.

10. Regarding claim 11, Schadt discloses a liquid crystal device according to claim 1 (see figures 1 and 6, for instance) wherein a uniformly aligned first photo-alignment layer (21a) covers the substrate in the entire area of the device, the latent image is formed by a pattern in a second photo-alignment layer (22a) applied to the first photo-alignment layer (21a), and the liquid crystal layer (22b) covers at least the second photo-alignment layer (22a). Claim 11 is therefore unpatentable.

11. Regarding claim 13, Schadt discloses a liquid crystal device according to claim 11 (see figures 1 and 6, for instance) wherein the liquid crystal layer (22b) is applied to the second photo-alignment layer (22a) in the pattern representing the latent image. Claim 13 is therefore unpatentable.

12. Regarding claim 14, Schadt discloses a liquid crystal device according to claim 3 (see figures 1 and 6, for instance) wherein the latent image is laser written (column 6, lines 26-41) into the at least one photo-alignment layer (3). Claim 14 is therefore unpatentable.

13. Regarding claim 15, Schadt discloses a liquid crystal device according to claim 11 (see figures 1 and 6, for instance) wherein the latent image is laser written (column

6, lines 26-41) into the second photo-alignment layer (22a). Claim 15 is therefore unpatentable.

14. Regarding claim 16, Schadt discloses a liquid crystal device according to claim 3 (see figures 1 and 6, for instance) wherein the latent image is laser written into the liquid crystal layer (4, column 8, lines 61-65). Claim 16 is therefore unpatentable.

15. Regarding claim 17, Schadt discloses a liquid crystal device according to claim 1 (see figures 1 and 6, for instance) wherein the liquid crystal layer (4) is fixed by curing (column 6, lines 33-35). Claim 17 is therefore unpatentable.

16. Regarding claim 18, Schadt discloses a liquid crystal device according to claim 1 (see figures 1 and 6, for instance), which includes a coating (22b) over the liquid crystal layer (25). Claim 18 is therefore unpatentable.

17. Regarding claim 19, Schadt discloses a liquid crystal device according to claim 17 (see figures 1 and 6, for instance) wherein the coating (25) has a refractive index which substantially matches the refractive index of the liquid crystal layer (22b). Claim 19 is therefore unpatentable.

18. Regarding claim 20, Schadt discloses a liquid crystal device according to claim 18 (see figures 1 and 6, for instance) wherein the coating (25) covers the liquid crystal layer (22b) in such a manner to provide a device of substantially uniform height. Claim 20 is therefore unpatentable.

19. Regarding claim 21, Schadt discloses a method of manufacturing a polarizing liquid crystal device (see figures 1 and 6, for instance) comprising steps of applying at least one photo-alignment layer (3) to a substrate (1); uniformly aligning the photo-

alignment layer (3) with a polarized light source (column 6, lines 26-28); applying a liquid crystal layer (4) to the photo-alignment layer (3); and forming a pattern representing a latent image in the at least one photo-alignment layer and/or the liquid crystal layer without the use of a mask (column 6, lines 29-41). Claim 21 is therefore unpatentable.

20. Regarding claim 22, Schadt discloses a method according to claim 21 (see figures 1 and 6, for instance) including the step of writing image areas and/or non-image areas in at least one of the layers (column 8, lines 61-67; column 9, lines 1-4). Claim 22 is therefore unpatentable.

21. Regarding claim 23, Schadt discloses a method of manufacturing a liquid crystal device (see figures 1 and 6, for instance) comprising steps of applying at least one photo-alignment layer (3) to a substrate (1); uniformly polarizing the photo-alignment layer (3) with a polarized light source (column 6, lines 26-28); applying a liquid crystal layer (4) to the photo-alignment layer (3); and forming a latent image in the at least one photo-alignment layer and/or the liquid crystal layer by writing image areas or non-image areas in at least one of said layers (column 6, lines 29-41). Claim 23 is therefore unpatentable.

22. Regarding claim 24, Schadt discloses a method according to claim 23 (see figures 1 and 6, for instance) wherein a laser is used to write the image areas and/or non-image areas (column 6, lines 26-28). Claim 24 is therefore unpatentable.

23. Regarding claim 25, Schadt discloses a method according to claim 24 (see figures 1 and 6, for instance) wherein a laser is used to remove (column 15, lines 66-67;

column 16, lines 1-4) image areas or non-image areas of the at least one photo-alignment layer (3) and/or the liquid crystal layer (4). Claim 25 is therefore unpatentable.

24. Regarding claim 26, Schadt discloses a method according to claim 25 (see figures 1 and 6, for instance), wherein the uniformly aligned photo-alignment layer (3) is applied over the substrate (1) in the entire area of the device, and the laser is used to ablate non-image areas of the photo-alignment layer to leave non-ablated image areas (column 15, lines 66-67; column 16, lines 1-4). Claim 26 is therefore unpatentable.

25. Regarding claim 27, Schadt discloses a method according to claim 25 (see figures 1 and 6, for instance) wherein the liquid crystal layer (4) is applied to the non-ablated image areas of the photo-alignment layer (3) in the pattern representing the latent image (column 2, lines 7-12). Claim 27 is therefore unpatentable.

26. Regarding claim 28, Schadt discloses a method according to claim 25 (see figures 1 and 6, for instance) the laser is used to ablate non-image areas of the liquid crystal layer (4) to leave non-ablated image areas (column 15, lines 66-67; column 16, lines 1-4) in a pattern forming the latent image. Claim 28 is therefore unpatentable.

27. Regarding claims 29-30, Schadt discloses a method according to claim 24 (see figures 1 and 6, for instance) wherein the uniformly aligned photo-alignment layer (3) is applied over the substrate (1) in the entire area of the device (7), and a UV laser (column 15, lines 12-14) is used to change the photo-alignment state (column 15, lines 14-16) of the photo-alignment layer (3) in the image areas and/or non image areas, and wherein the UV laser has a wavelength of about 280 nm or less (column 15, lines 12-14). Claims 29-30 are therefore unpatentable.

28. Regarding claim 31, Schadt discloses a method according to claim 29 (see figures 1 and 6, for instance) wherein the liquid crystal layer (4) is applied to the photo-alignment layer in a pattern representing the latent image (column 6, lines 29-41). Claim 31 is therefore unpatentable.

29. Regarding claim 32, Schadt discloses a method according to claim 21 (see figures 1 and 6, for instance) including the step of printing the latent image in at least one of the layers (column 7, lines 44-49). Claim 32 is therefore unpatentable.

30. Regarding claim 34, Schadt discloses a method according to claim 33 (see figures 1 and 6, for instance) including the step of applying the photo-alignment layer (3) over the substrate (1) in the entire area of the liquid crystal device (7) before the liquid crystal layer (4) is applied in the pattern. Claim 34 is therefore unpatentable.

31. Regarding claim 36, Schadt discloses a method according to claim 35 (see figures 1 and 6, for instance) including the step of applying the liquid crystal (4) area over the entire area of the liquid crystal device (7). Claim 36 is therefore unpatentable.

32. Regarding claim 37, Schadt discloses a method of manufacturing a polarizing liquid crystal device (see figures 1 and 6, for instance) having steps of applying a first photo-alignment area (21a) to cover the substrate (1) over the entire area of the device (7); uniformly aligning the first photo-alignment layer (21a) with polarized light; applying a second photo-alignment layer (22a) in a pattern representing the latent image (column 7, lines 36-41); aligning the second photo-alignment layer (22a) with polarized light at an angle different to the alignment of the first photo-alignment layer (21a); and applying the nematic liquid crystal layer (22b) to the second alignment layer (22a) in the pattern

representing the latent image (column 7, lines 36-41). Claim 37 is therefore unpatentable.

33. Regarding claims 41-42, Schadt discloses a method according to claim 21 (see figures 1 and 6, for instance) further including the step wherein the liquid crystal layer (4) is fixed by curing, and wherein UV radiation is used to cure the liquid crystal layer (column 6, lines 33-35). Claims 41-42 are therefore unpatentable.

34. Regarding claim 43, Schadt discloses a method according to claim 21 (see figures 1 and 6, for instance) including the step of applying a coating (5) over the liquid crystal layer (4). Claim 43 is therefore unpatentable.

35. Regarding claim 44, Schadt discloses a method according to claim 43 (see figures 1 and 6, for instance) wherein the coating (5) has a refractive index which substantially matches the refractive index of the liquid crystal layer (4). Claim 44 is therefore unpatentable.

36. Regarding claim 45, Schadt discloses a method according to claim 43 (see figures 1 and 6, for instance) wherein the coating (5) is applied over the liquid crystal layer (4) so as to provide a liquid crystal device (7) of substantially uniform height. Claim 45 is therefore unpatentable.

37. Regarding claim 46, Schadt discloses a polarizing liquid crystal device (7) manufactured by the method of claim 21 (column 8, lines 42-45). Claim 46 is therefore unpatentable.

38. Regarding claim 47, Schadt discloses a security document or token incorporating a polarizing liquid crystal device in accordance with claim 1 (column 8, lines 42-45). Claim 47 is therefore unpatentable.

39. Regarding claim 48, Schadt discloses a security document or token according to claim 47 (see figures 1 and 6, for instance) wherein the latent image is a portrait corresponding to the holder of the security document (column 2, lines 64-67; column 3, lines 1-6). Claim 48 is therefore unpatentable.

40. Regarding claim 49, Schadt discloses a security document or token according to claim 47 (see figures 1 and 6, for instance) wherein the polarizing liquid crystal device (7) containing the latent image is provided in a window of the security document (column 8, lines 42-45). Claim 49 is therefore unpatentable.

41. 50. A security document or token according to claim 47 (see figures 1 and 6, for instance) wherein the document includes cross-polarizers (24, 25) in a window for verifying the latent image formed by the polarizing liquid crystal device (7; column 8, lines 42-45). Claim 50 is therefore unpatentable.

Claim Rejections - 35 USC § 103

42. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

43. Claims 6, 9, 33, 39, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schadt et al. (US 6,734,936) in view of Knight et al. (US 5,678,863).

44. Regarding claims 6, 9, 33, 39, and 40, Schadt discloses a liquid crystal device according to claims 1, 21, 32, and 37 (see figures 1 and 6, for instance) wherein the liquid crystal layer (4) is applied to the first and second photo-alignment layers. However, Schadt does not expressly disclose wherein the method of application is variable printing.

45. Regarding claims 6, 9, 33, 39, and 40, Knight discloses a liquid crystal device similar to that of Schadt (see figures 5a and 5b, for instance), wherein all liquid crystal layers are variably printed on the photo-alignment layer in the pattern forming the latent image (column 6, lines 49-57).

46. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the printing process of Knight in the method of manufacturing the device of Schadt. The motivation for doing so would have been to create more detailed images that could be applied in each layer making reproduction virtually impossible, as taught by Knight (column 6, lines 53-56). Claims 6, 9, 33, 39, and 40 are therefore unpatentable.

47. Claims 5, 7, 12, 35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schadt et al. (US 6,734,936) in view of Yip et al. (US 6,582,776).

48. Regarding claims 5, 7, 12, 35, and 38, Schadt discloses a liquid crystal device according to claims 1, 11, 32, and 38 (see figures 1 and 6, for instance), wherein the photo-alignment layers (3, 22b, 21b) are applied to the substrate in the pattern forming the latent image (column 15, lines 66-67; column 16, lines 1-4). However, Schadt does

not expressly disclose wherein the photo-alignment layers are printed onto the substrate.

49. Regarding claims 5, 7, 12, 35, and 38, Yip discloses a method of forming a photo-alignment layer, wherein the photo-alignment layers are printed on the substrate (column 7, lines 26-31).

50. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the printing method of Yip in the method of manufacturing the device of Schadt. The motivation for doing so would have been to obtain a photo-alignment layer that displays excellent long-term photochemical stability, as exemplified in the invention of Yip (column 3, lines 9-12). Claims 5, 7, 12, 35, and 38 are therefore unpatentable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathanael Briggs whose telephone number is (571) 272-8992. The examiner can normally be reached on 8:30 AM to 5:00 PM (EST) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathanael Briggs
9/21/2006

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